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State of South Carolina Enterprise Technology Architecture

Domain Subcommittee Guidebook

Developed By

Division of the State CIO

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Section 1: Introduction to the Domain Subcommittee Guidebook

The South Carolina Enterprise Architecture (SCEA) is constantly changing and evolving. This is because the information needs of state agencies are continually changing, and the SCEA provides a means to address these needs through a structured review, evaluation and adoption of new and emerging technologies. It also provides a method to contain and eventually retire technologies that are no longer cost effective. It is for these reasons that the Division of the State CIO (CIO) has developed this Guidebook. It is to be used as a reference to guide participants through the processes involved in establishing, maintaining and updating the SCEA. This document contains information for domain subcommittees, discipline committees and workgroups that will help them understand the various technical and governance processes that have been adopted by the Architecture Oversight Committee to make the SCEA a self-sustaining program.

Background and Goals

The CIO embarked on a project in May 2002 to establish an enterprise technical architecture to be used as a framework for making strategic information technology decisions on a cost effective, statewide basis. These IT decisions must meet the diverse business needs of agencies in the executive, legislative and judicial branches of state government. It was determined from the beginning of the project that to be successful, the State of South Carolina's enterprise technical architecture would have to:

- Be based on the strategic business direction of the State as an enterprise.
- Involve agency business managers as well as IT staff throughout the process.
- Be developed and maintained through a shared vision and the use of collaborative processes involving all state agencies.
- Provide strategic direction for making technology decisions without requiring wholesale changes to the current IT environment.
- Allow agencies to share many IT infrastructure components without sacrificing responsiveness to the changing business needs of individual agencies.
- Reduce the time it takes IT to satisfy ever shorter agency business change cycles by making the IT environment adaptable to change.
- Reduce the cost of IT over the lifecycle of each system.
- Have a governance process that supports the ongoing evolution of the architecture as well as its enforcement.
- Evolve in unison with changes in business strategies.

In July 2002, an Enterprise Architecture Committee, made up of managers from the CIO and nineteen state agencies, was established to develop a Technology Baseline for the State (an inventory of the technology being used in state agencies) and to identify the enterprise business requirements of the State for use within the SCEA process. The business requirements were documented in the Enterprise Architecture

Figure 1: Six Technology Architecture Domains

1. Presentation Services
2. Communication Services
3. Security
4. Computing Services
5. Enterprise Applications
6. System Management Services

Framework published by this Committee in May 2003. The Enterprise Architecture Framework is divided into two parts: the Business Architecture Structure and the Technology Architecture Structure.

The Business Architecture Structure includes the State's major business drivers, business information requirements, implications for technology and principles for making technology decisions, and provides the link between the technical architecture and the business needs of agencies and the State. The Business Architecture Structure provided the core business principles on which all the technical domain architecture recommendations are based. The current business drivers, technology implications, technology vision and technology principles are documented on the SCEA Web site at http://www.cio.sc.gov.

The Technology Architecture Structure includes three major components: the IT taxonomy, domain profiles and discipline profiles. The IT taxonomy categorizes related technologies, called disciplines, into domains which logically comprise the Technical Infrastructure. There is a profile for each domain, which describes each portion of the Technical Infrastructure, including the plan of action and rules to guide decision-making concerning a discipline. This profile establishes limits as to the architectural decisions that can be made for each discipline. The Technology Architecture Structure also includes discipline profiles, which document the boundaries, life cycle and standards for each discipline.

The Enterprise Architecture is divided into six domains (see Figure 1 above), or groups of related technologies, that include the major technology components utilized by most state agencies. Six domain subcommittees, composed of technical experts from across State government, have been established to recommend standards concerning the technical architecture for each domain. The results will be documented in domain and discipline profiles. These profiles define the domain strategies, domain principles, technical standards, product standards (if appropriate), and implementation/migration guidelines to be utilized by state agencies. It is the responsibility of the domain subcommittees to maintain and update the domain and discipline profiles when changes in the environment occur. Requests by state agencies for exemptions from the domain architectures and appeal of decisions by the Architecture Oversight Committee are handled through formal processes that include review and recommendations from the domain subcommittees and approval by the Architecture Oversight Committee.

Contents of this Guidebook

This manual is designed to provide guidance to the chairpersons and members of domain subcommittees, as well as workgroups and discipline committees, as to their roles in developing, updating, and refining the enterprise technology architecture and the related profiles.

The chapters are organized as follow:

- Subcommittee Management Guidelines – for subcommittee chairpersons. Provides guidance on organizing and managing domain subcommittees and their workload; also provides information on subcommittee member roles and responsibilities.

- Developing a New Domain Architecture – for new domain subcommittee members and/or chairpersons charged with developing a new technical domain. Provides basic information on what a domain profile is, and the process to be used to develop the new version of the architecture.

- Updating a Domain Architecture – for subcommittee chairpersons and members, workgroups and discipline committees. Provides reference material about what triggers the need for a change to the domain architecture, the process for documenting recommendations for the update, and how updates are approved and published.

- Identifying and Closing Gaps in a Domain Architecture – for subcommittee chairpersons and members. Provides guidance on how to perform gap identification, analysis and resolution for a domain architecture.

- Researching New Technologies, Products and Standards – for subcommittee chairpersons and members. Provides guidance on how research of technology is conducted, documented and used to make decisions concerning changes to, and to assess compliance with, the domain architecture.

- Coordination with IT Planning and IT Procurement – for subcommittee chairpersons and members. Describes activities that may be requested of domain subcommittee members in coordination with IT Planning and IT Procurement.

- Appendices - provides the templates used to structure SCEA deliverables, SCEA process diagrams, roles and responsibilities of all SCEA governance bodies, and other relevant background information.

Section 2: Domain Subcommittee Management Guidelines

This Section is designed to provide guidelines for the domain subcommittee chairperson on managing domain subcommittee activities, organizing and prioritizing workloads, and documenting deliverables. In addition, it clarifies the roles and responsibilities of domain subcommittee members, workgroups and discipline committees.

Roles and Responsibilities

Domain Subcommittee - Chairperson

Each domain subcommittee has a chairperson who will oversee and coordinate the activities of the subcommittee to keep the domain architecture current and relevant, and to represent the subcommittee in cross-domain and enterprise architecture planning activities.

The responsibilities of the subcommittee chairperson include managing all subcommittee activities, communications and outputs to include:

- Periodic updating of the domain architecture and associated profiles.
- Coordinating the meetings and managing the operations of the domain subcommittee, including the need to have regular meetings and ensuring that there is a broad base of expertise on the subcommittee to cover the technical disciplines making up the domain.
- Ensuring that the disciplines assigned to the domain are appropriate and providing any cross-domain coordination needed.
- Provide an environment where all domain subcommittee members are encouraged to participate and where research/learning can occur.
- Developing and managing the execution of a work plan for all activities and deliverables for which the subcommittee is responsible, to include:
  a. Developing an understanding of the goals set forth in the Enterprise Architecture Framework.
  b. Developing domain specific deliverables (i.e., domain and discipline profiles).
  c. Coordinating on-going research activities of subcommittee members to include utilization of external research services (e.g. Gartner) and vendor presentations.
  d. Performing gap analyses to identify gaps between the Technology Baseline and the "future state" for each of the technologies within the domain subcommittee's purview.
  e. Identifying and developing initiatives to resolve gaps.
  f. Evaluating requests, projects and proposals to determine conformance with the domain architecture.
  g. Ensuring that the domain architecture and documents are refreshed as needed.
- Identifying the resources required for the tasks listed above as part of work plan development.
- Assigning tasks to subcommittee members and establishing workgroups and discipline committees as needed to satisfy the responsibilities of the domain subcommittee.
- Coordinating and communicating with other domain subcommittees, the CIO Architecture Support Group (CIO-ASG) and the Architecture Oversight Committee (AOC).

- Documenting domain subcommittee activities, domain and discipline profiles, and preparing status reports and other deliverables required for approval of domain architecture additions or modifications.

Domain Subcommittee - Members

The members of the domain subcommittees provide the knowledge and expertise required to develop the domain architectures. These subcommittees are responsible for the development and maintenance of the content of the domain architecture and related documents, including domain specific deliverables such as disciplines profiles, technical standards, product standards, migration strategies, dependencies and best practices. Subcommittee members are expected to keep abreast of new technology and make recommendations on new technology to close gaps in the current environment.

Each domain subcommittee will consist of state agency technical personnel who have expertise in one or more of the disciplines that make up the domain architecture. Membership is usually assigned on a year-to-year basis, and members are expected to keep abreast of the technical trends and standards for their area of expertise. Members are to provide support and consultation for the domain subcommittee based upon what is best for the State of South Carolina as an enterprise.

Responsibilities of domain subcommittee members include:

- Attending regular domain subcommittee meetings.
- Ongoing enhancement of the domain architecture through the successful completion of tasks requested by the subcommittee chairperson.
- Ongoing research in assigned technical areas based on the member's expertise.
- Serving as chairperson or member of a workgroup.
- Providing technical consulting in assigned technical areas as requested by the subcommittee chairperson.
- Communicating the SCEA and the domain architecture to state agencies and vendors.

Temporary Workgroups

The domain subcommittee chairperson may establish workgroups to conduct research on specific issues and to evaluate technologies related to the domain architecture. The domain subcommittee chairperson will appoint a chairperson to oversee the activities of the workgroup. The workgroup chairperson must be a member of the domain subcommittee. Other members of the workgroup should include interested domain subcommittee members, and subject matter experts from other government agencies, etc. that have knowledge of the specific issue or technology. Upon formation of a workgroup, the domain subcommittee will provide the workgroup with a charter, mission statement and list of expected deliverables.

Responsibilities of the workgroup chairperson include:

- Directing the activities of the workgroup.
- Reporting status of activities back to the subcommittee chairperson.
- Ensuring completion of deliverables assigned to the workgroup.

Discipline Committees

Discipline committees may be established by the Architecture Oversight Committee or the domain subcommittee chairperson to oversee specific technologies or projects related to the domain architecture. The discipline chairperson works with the subcommittee to develop specific objectives, tasks and deliverables. The chairperson is typically an expert in the technology being investigated.

The discipline chairperson communicates recommendations back to the domain subcommittee for discussion and approval. The discipline committee's tasks include research, evaluation and formulation of recommendations for new technical or product standards for the discipline and their implementation. (See SCEA Update Process)

Responsibilities of the discipline chairperson include:

- Directing the activities of a discipline committee.
- Reporting status of activities back to the subcommittee chairperson.
- Ensuring completion of deliverables assigned to the discipline committee.

Domain Subcommittee Meetings

Domain subcommittee meetings should be conducted on a regular basis. The frequency of such meetings should be dictated by workload, but it is recommended that they be conducted at least quarterly. Sessions will be scheduled at the discretion of the domain subcommittee chairperson. Discipline committees will meet at the discretion of the chairperson for these groups.

The meetings of the domain subcommittee should be documented with minutes or a detailed meeting summary (see Form SCEA-6, Status Report from a Domain Subcommittee, in Appendix 2). Recommendations for additions, deletions and modifications to the domain architecture are to be submitted to the Architecture Oversight Committee with supporting documentation for approval. Any dissenting opinions must also be submitted to the Architecture Oversight Committee.

How to Target, Qualify, Obtain and Retain Subcommittee Members

Each domain is made up of a group of related technologies called disciplines. While it is ideal to have an expert on the domain subcommittee for each discipline, experts may not be available from state agencies for some components and the size of the subcommittee needs to be kept to a manageable number. Gartner Group recommends domain subcommittees of approximately eight to ten members, with eight as the ideal size. The goal is to maintain a broad level of expertise on the subcommittee with some members responsible for one or more technologies. Additional technology expertise from outside the subcommittee can be used to conduct specific research activities, when necessary.

Recruiting the best-qualified personnel is one of the most difficult tasks of the domain subcommittee chairperson, since the best-qualified personnel are usually the busiest. Methods for targeting needed expertise include:

- Word-of-mouth among domain subcommittee members (the domain subcommittee members represent a community of technical experts that often know who their peers are across the State and know it is in their best interests to have a qualified team).
- Utilizing the Skills Gap Analysis, when completed by the CIO, to secure a profile of technical experience across state government.
- Posting opportunities in various listservs and newsletters that are available to these technical experts.
- Working with the IT Planning Office to identify agency projects that may require personnel trained in the desired technologies or the acquisition of outside expertise in a technology area that is not covered by any expertise on the subcommittee. Specialized technical expertise that must be acquired for an agency project could be utilized by the domain subcommittee to help evaluate this technology from a statewide, as well as, the project perspective.
- Utilizing the other SCEA groups such as the CIO or the AOC to find in-house expertise.

Qualifying the potential new member will require an understanding of the experience and competence needed for that technology component. Ideally, members should have some hands on experience with major aspects of the targeted technology.

With the constant changes in technology, chairpersons should look for a broad profile of expertise that demonstrates an understanding and aptitude for this area of technology. Subcommittee members should have an understanding of the technology and how it is applied, rather than just expertise with one or two products or technology components. The chairperson can work with the CIO to identify training opportunities and to access research needed to augment the experience of a subcommittee member.

Once a qualified person has been identified, the next step is to "get them on-board". While knowledge of the SCEA process will increase over time, the chairperson should not assume that the person knows anything about SCEA or architecture. Capturing their interest will depend on the chairperson's ability to convince them that the time spent in this process has value to them and the State of South Carolina. It would be prudent to identify other people that this person can talk to about the value of the architecture program. The CIO will also assist the domain chairperson in orienting this person to the benefits of an enterprise technology architecture.

Once an individual agrees to participate on a domain subcommittee, the next step is to obtain approval from their management to provide them adequate time to participate. A chairperson should work with the CIO to communicate the value of SCEA directly to the new member's management. The value must be articulated in terms of how it may help that agency, the projects being planned or implemented, the expertise of the person needed, and the ability to integrate systems with outside agencies and organizations. The time commitment may need to be limited, at first, until the person or his/her management sees this value. This may mean limiting the person's involvement on workgroups or initiatives at first. It may also mean securing an

endorsement from the AOC to demonstrate the importance of this person's participation to the State of South Carolina.

To retain valuable technical expertise on the domain subcommittee, it is important that members and their management are aware of the accomplishments of the subcommittee. Subcommittee members should be encouraged and acknowledged for their work, whenever possible.

Training Requirements

All domain subcommittee chairpersons should attend a half-day training session on the SCEA program. This provides context on how the architecture processes works, the purpose of each process, and on their role in these processes. Periodic sessions on the SCEA program for workgroup and discipline chairpersons will be made available as well. In addition, all subcommittee, workgroup and discipline committee members are encouraged to receive training in their areas of expertise. While the CIO does not provide direct funding for individuals to do this, appropriate training is often a matter of knowing what classes are available and members convincing their management as to its value. Chairpersons should obtain and share information on training opportunities about technologies within their domain. A chairperson should also provide mentoring for a new/replacement subcommittee member, through, at least, their first few subcommittee meetings.

The CIO will coordinate briefings by experts from external research services (e.g. Gartner, META, etc.) and provide research materials on specific topic upon request by domain or discipline committees. The CIO will also monitor and disseminate information from standards organizations and the federal government, as appropriate. Some vendors will provide product training at no cost. It is up to the domain chairperson and subcommittee members to take advantage of these opportunities. There are also many specialized listservs and Web sites designed to keep technology communities updated and in touch. In addition, initiatives to define standards and best practices in new technologies will require vendor assessments and on-site visits, which will provide additional opportunities to learn about the technologies.

Documentation and Status Reporting Requirements

The domain and discipline profiles are the primary deliverables of a domain subcommittee, and are the responsibility of the domain chairperson. These profiles document the decisions of the domain subcommittee and the research/input from workgroups and discipline committees. This document is a repository of information describing domain disciplines, as well as the associated standards, migration strategies, dependencies, and guidelines that will be used by state agencies to implement technologies and systems. It is important that these profiles continue to be updated and enhanced so that the work of the domain subcommittee has meaningful impact on all systems being built or enhanced. The process and associated documentation requirements are described in the Updating a Domain Architecture Section of this Guidebook.

Domain subcommittee meetings should be documented with minutes or a meeting summary and shared with the other domain subcommittee and the Architecture Oversight Committee to give everyone information on what activities and issues are being addressed. This provides information needed to identify and coordinate cross-domain activities (see Form SCEA-6, Status

Report from a Domain Subcommittee, in Appendix 2). Workgroups and discipline committees must provide status reports on active initiatives to the domain chairpersons as well. The decision on the frequency of these meetings and the format of the status reports is left up to the domain chairperson.

Managing and Prioritizing Workloads of Domain Subcommittees

Domain subcommittee members are normally expected to be available for one day a month to support the work of the subcommittee. Additional time may be requested of a member for work on a workgroup, with such work possibly requiring up to one or two days a month. A domain subcommittee chairperson normally requires the equivalent of an extra half day a month to manage a domain subcommittee, meet with other domain chairpersons to discuss cross-domain issues, and to represent the subcommittee at planning and compliance meetings. Additional time may be required by chairpersons to oversee the work of workgroups, deal with gaps, track the status of domain work, and conduct their own research.

With a limited amount of available resources and the significant amount of work involved in the architecture process, it is important that workloads be identified and organized. Workload planning is one of the important responsibilities of the domain subcommittee chairperson.

Prioritizing Workloads

Before workload can be defined and delegated, it is important to categorize the work so that it can be prioritized on an ongoing basis. While work should be prioritized within each category, the categories have different priorities relative to each other. Domain subcommittee workload can be categorized and prioritized on the following basis:

- Responding to Changes in the State's Business Needs - The successful implementation of SCEA is dependent on the technical domain architectures being able to directly support the business drivers and the associated IT architecture principles. Therefore, the domain architecture must be reviewed periodically to assess the impact of changes to the business drivers and environmental trends of the State. This review must be the highest priority because of the potential impact to the ongoing work of the team.

- Identifying Gaps in the Domain Architecture - Beside the annual refresh of the domain architecture and ongoing work on the domain and discipline profiles, completing gap initiatives is the core ongoing work of the subcommittee (see Section 5, Identifying and Closing Gaps in a Domain Architecture). Gaps are prioritized once or twice a year by the subcommittee and in conjunction with the other domain subcommittees. Project plans for the highest priority gap initiatives are completed by the domain chairperson and assigned to discipline committees or workgroups. Priorities for gap initiatives are usually based on subcommittee input, the dependencies of other domains, CIO priorities and availability of resources. While additional gaps may be found throughout the year, gap priorities do not change often. Gap initiatives are the second highest priority for ongoing domain work.

- Conducting Architecture Conformance Reviews - Domain subcommittees have a role to play in the governance of the SCEA. One aspect of this is to review requests from agencies for

architecture conformance. This activity includes comparison of technology and projects with existing standards. This work is usually considered a high priority because it usually involves large projects and affects their timetables. Domain chairpersons are dependent on good project planning by agencies to ensure that this work can be scheduled in a timely manner and with a minimum of interruption to the ongoing work of the subcommittee. Chairpersons should work closely with the CIO and the AOC to estimate resource requirements and schedule time for work. Conformance reviews can take two to three sessions to complete and may require the participation of multiple subcommittee members. Reviews requiring significant resource time may require chairpersons to document the impact on other projects and report this to the AOC for assessment.

- Evaluating Exemption Requests - Another ongoing responsibility of domain subcommittees is the review and evaluation of requests for an exemption from an architecture standard. Requests from agencies for exceptions to the architecture will be submitted to the domain subcommittee for a written evaluation and recommendation to the Architecture Oversight Committee.

- Updating the Domain Architecture - To be meaningful, the domain architecture must be updated periodically to relate to changes in the State's needs as well as the technology available. In addition, the domain and discipline profiles should be refined to make them more useful and to provide guidelines on implementing the architecture.

  This ongoing updating and refinement process is not as high a priority as the previous categories, but the resources and work involved must be accounted for in work plans to ensure it takes place. Much of this updating is an outcome of the SCEA Update Process, while the refinement of documents requires a more diligent management approach by the domain subcommittee chairperson.

- Researching Technology Components and Training - Domain subcommittee members should be assigned specific technology components to keep abreast of and identify changes in technology trends that may effect the refresh cycle or cause a gap in the architecture. Adequate time and access to information and training should be allocated to each expert, although most IT professionals keep up with technology related to their expertise during work hours while completing other duties. See Section 6, Researching New Technologies, Products and Standards, for more information on this activity.

Developing and Documenting Work Plans for Domain Subcommittees

With the need to balance the workload and priorities of different categories of work in a domain, the subcommittee chairperson needs to organize all work with a comprehensive work plan. A template is provided in Appendix 2 (Form SCEA-7, Work Plan for a Domain Subcommittee) to help monitor resources needed, timeframes required and deliverables involved with each task.

Work involving gap initiatives will be documented on a Gap Analysis Report from a Domain Subcommittee, Form SCEA-9, which requires Architecture Oversight Committee Approval (see

Appendix 2) so that it can be conducted by the subcommittee or delegated to discipline committees or workgroups for completion.

All work of the subcommittee should be managed based on the priorities in the work plan. The domain subcommittee work plan should facilitate the organization and scheduling of work as well as to adjusting to the impact of new priorities such as compliance reviews and project evaluations.

Use of Workgroups to Conduct Research and Provide Recommendations

Workgroups may be established by a domain subcommittee chairperson to conduct research and provide recommendations on specific technology issues/topics. A workgroup should be used whenever the work to be performed is temporary in nature (e.g. evaluate a new/emerging technology) and does not require the efforts of the entire domain subcommittee. A workgroup chairperson is assigned to oversee the group and provides status reports to the domain chairperson. When the workgroup has completed its work, the chairperson of the workgroup communicates/presents the recommendations back to the full domain subcommittee for discussion and approval. See Section 4, Changes to a Domain Architecture, for more details on how to use workgroups to manage workload.

Implementing the Enterprise Architecture

Ideally, the enterprise architecture will guide all IT decision making (infrastructure, application development, operations, etc.). An awareness of architectural conformance must become second nature. The domain architectures are intended to provide guidance for many day-to-day IT activities and decisions. For example:

- IT procurements,
- State term contracts,
- Buy-versus-build decisions,
- Development of evaluation criteria in RFPs,
- Hardware upgrades,
- Software package/tool selection, and
- Design decisions in the context of a specific IT project/system.

Section 3: Developing a New Domain Architecture

This section is about creating a domain architecture for the first time. The process for changing an existing domain architecture is discussed in the Section 4 of this Guidebook. This Section should be read by anyone who is not familiar with the SCEA process, in particular, new members of domain subcommittees or individuals assigned to develop the architecture for a new domain. The most important thing to remember about developing a domain architecture is that it is a collaborative, iterative, creative process. A team effort is required because of the complexity of the individual technologies and their interdependencies. Domain architectures are never complete because change is a constant in the realm of information technology and in the realm of government services. Architecture development is a creative endeavor that requires thoughtful analysis and inspired thinking to respond to the many challenges inherent in an architectural approach to deploying and managing technology to satisfy the business needs of state agencies.

What is a Domain?

A domain is comprised of a group of related technologies called disciplines, usually organized around common IT infrastructure services or information management functions. The Architecture Oversight Committee is responsible for determining how many technology domains are appropriate and assigning individual disciplines to them. The list of disciplines typically included technologies currently in use and new technologies that are likely to be implemented in the near future. There are currently six domains: Presentation Services, Communication Services, Security, Computing Services, Enterprise Applications and System Management Services.

What is the Purpose of a Domain Architecture?

The purpose of a domain architecture is to identify, through a structured process, the technologies, industry standards and/or products in a specific technology group that best support the business and technical requirements of South Carolina State government. The technologies, industry standards and/or products identified through this process should comply with and further the principles set forth in the Business Architecture and Technical Architecture. A domain architecture provides:

- An overarching strategy for the selection of technologies and products in a domain that meet the business and information technology needs of state agencies.
- Principles that "flow down" from and support the Business Architecture and Technical Architecture Structures with rationales and implications further articulated for the specific disciplines.
- The design principles specific to the domain technologies.
- Technical standards for the domain technologies.
- Product standards for the domain technologies.
- Strategies to migrate from the present technical environment to the selected technologies and products.
- Guidelines, methods and dependencies for the implementation and management of the domain technologies.

Why Do We Need Domain Architectures?

The South Carolina Enterprise Architecture (SCEA) is divided into an interrelated set of six domain architectures. They are intended to guide all IT activities to support the State's business strategies and information requirements. These activities include the planning, design, selection, construction, deployment, support and management of information technologies. The SCEA will also provide the basis for evaluating and prioritizing changes to the State's portfolio of information systems.

What is a Domain Architecture Based On?

When a domain subcommittee is charged with developing the technical architecture for a group of related technologies, the framework for their research and deliberations is provided by the Enterprise Architecture Framework. The rationale for doing this is twofold. First, the use of a common framework allows multiple subcommittees to work in parallel with some assurance that their recommendations will align with each other and support the work of domains with which there is technological overlap. Secondly, the domain architecture is based on a set of principles and requirements that are derived from the agencies' business drivers and business strategies. Defining the domain architectures within this business context provides the initial alignment of information technology to the State's business needs.

To provide a context for domain decisions, it is useful to have a mental map of the relationships between the deliverables defined during the creation of the Enterprise Architecture Structure. Those relationships are as follows.

<u>Business Architecture</u>

- Enterprise Business Drivers – Major areas of focus for an organization based on its mission, services and constituents.

- Enterprise IT Implications – Key business issues relevant to IT that should be addressed in order to satisfy the business drivers.

- Enterprise IT Vision – Foundation statement regarding the role of IT in serving the business needs and direction of the organization.

- Enterprise IT Principles – Fundamental guides for technology decision-making. These principles are based on key values, standards and beliefs that provide the foundation upon which the architectural design is built.

<u>Technology Architecture</u>

- IT Taxonomy - Categorizes related technologies (disciplines) into domains which logically compose the technical infrastructure.

- Domain Profile – Describes each portion of the technical infrastructure, including the plan of action and rules to guide decision-making concerning a discipline. Sets limits as to the architectural decisions that can be made for each discipline.

- Discipline Profile – Documents the boundaries, life cycle and standards for each discipline.

For an explanation of the process via which each of these deliverables is created, refer to the description of the Enterprise Architecture Process documented on the CIO web site at http://www.cio.sc.gov.

Domain Chairperson Activities

The domain chairperson must lead, guide, push, pull, cajole and encourage subcommittee members to complete their individual assignments and to fulfill the responsibilities of the subcommittee. Architecture development is an iterative, creative process. The subcommittee should be encouraged to approach its work with an open mind and leave "sacred cows" behind. The chairperson should strive to develop a rapport with each of the subcommittee members and to foster an atmosphere of mutual respect within the subcommittee. Delegation of work to subcommittee members is not only good survival strategy, but the subcommittee will be more effective when the members realize they are empowered to guide technology decisions for South Carolina State government.

As coordinator of all domain subcommittee activities, it is imperative for the chairperson to be well organized and to communicate openly and frequently with subcommittee members. Every member of the subcommittee must have complete and current documentation and understand what is expected of them at each step of the development of the domain architecture. Open and active communication with the CIO, with other domain chairpersons and with the AOC will be essential for the coordination and resolution of cross-domain issues. A number of technologies and technical standards impact multiple domains and will require creative thinking and collaboration across domain boundaries.

The chairperson is responsible for all documentation generated for publication as part of the domain architecture. Delegation of responsibility for meeting minutes and draft documents is appropriate, but the chairperson is responsible for the quality and completeness of any documentation produced by the subcommittee and all its workgroups. See Standard Format for Domain Subcommittee Documents below for information about the format and content requirements for domain subcommittee deliverables.

Domain Subcommittee Activities

Review and Acceptance of the Domain Technologies

The first task of a newly formed domain subcommittee is to review the disciplines assigned to the domain by the Architecture Oversight Committee. If the domain subcommittee believes that a technology is more appropriately addressed by another domain subcommittee, that recommendation must be proposed to and approved by the Architecture Oversight Committee. When a list of disciplines is finalized, the domain subcommittee chairperson must assess whether

the subcommittee has the expertise and experience to address these technologies. The recruitment and retention of appropriate membership is critical to the success of a domain subcommittee. The CIO-ASG can assist with recruitment of missing subject matter experts.

Review of Functionality and Major Issues for the Domain Technologies

It is important to organize the disciplines by relevant factors (i.e., types and number of users, types of applications, total expected investment in a technology, total volume, total expected benefits from standardization, etc.) in order to identify all functionality and interrelationship between disciplines, and to also facilitate prioritization and delegation of work. The subcommittee should prepare a list of issues that impact all or multiple disciplines within the domain. Missing technologies may be revealed during this brainstorming activity. The master list of domain technologies should be revised accordingly. A list of issues should also be compiled for each discipline within the domain. This information will help the subcommittee establish priorities, especially if it is not able to address all technologies within the time allowed for the initial development of the domain architecture.

Review and Adoption of Conceptual Architecture Principles

A thorough grounding in the Enterprise Architecture Structure is essential to the successful development of a domain architecture. Therefore, the third major task of the domain subcommittee is to analyze and interpret the principles set forth in the Enterprise Architecture Framework in terms of the domain's technologies. This analysis results in the adoption of these principles as the general principles for the domain, with rationales and implications that are specific to the technologies within the domain. Implications will become important during the completion of gap analysis activities. It is important that thoughtful consideration be given to implications of implementing domain technologies so that they conform to the principles in the Enterprise Architecture Framework.

Development of a Domain Strategy

The fourth major task of the domain subcommittee is to develop a strategy for the domain that aligns with the IT vision and principles of the enterprise architecture in terms of the domain's technologies. This strategy for the domain will provide the overarching concepts to drive/direct the decision-making processes of the subcommittee. This strategy also establishes the boundaries of the domain, and will guide the selection/scope of technical standards for the domain. The domain strategy is documented on the form SCEA-4, Domain Profile (see Appendix 2).

Defining Domain Principles Specific to the Domain Technologies

After the development of a domain strategy, it will become apparent that principles specific to the domain are needed to guide the development of standards. These domain principles should be documented in the same format as the general principles, complete with rationales and implications. The domain principles/boundaries are documented on the form SCEA-4, Domain Profile (see Appendix 2).

Setting Priorities for Domain Subcommittee

The subcommittee must establish priorities for its work based on a number of factors. These include:

- Availability of subject matter experts.
- Number of requests received and pending from agencies, the AOC, etc.
- Severity and urgency of issues.
- Major agency projects that require architecture review.
- Availability of resources to define low-level architecture specifications for configurations and to write implementation guidelines based on practical experience.
- Time available to complete the first iteration of architecture or mandatory reviews of existing standards.

Domain Architecture Gap Analysis

The first time through the SCEA process, there is usually insufficient time or expertise on the domain subcommittee to cover everything. These are gaps within the domain architecture. If current products or standards are not capable of meeting the strategic goals of the SCEA, these are additional gaps in the domain architecture. Each of the functional areas or technologies within the domain that require further research and analysis will be prioritized and incorporated into the domain subcommittee work plan by the domain chairperson. See Section 5, Identifying and Closing Gaps in a Domain Architecture, for additional information.

Review and Acceptance of Work by Discipline Committees and Workgroups

Some of the domain subcommittee's work will be delegated to members with deep technical knowledge and practical experience with one or more of the technologies. This allows multiple architecture research and evaluation efforts to run concurrently. All deliverables from discipline committees and workgroups are subject to review and acceptance by the full domain subcommittee. The subcommittee is responsible for ensuring that lower level decisions remain true to the Enterprise Architecture Framework, conform to the domain's own principles and will not create conflict with other domain architectures.

Discipline Profiles

The domain subcommittee must analyze each discipline within a domain to determine if a new standard is needed or if an existing standard should be updated, and if the enterprise will be best served by this being an industry, technical or product standard. This is accomplished by reviewing a number of factors including the industry status of the technology, the state's existing technology baseline, and the state's future business and technology needs. The domain subcommittee must also determine what industry standards already exist (e.g., formal or de facto), the potential cost of implementing the new standard, and if state personnel are available/trained for this purpose. This requires a significant amount of research and discussion by domain subcommittee members. The recommendations of the domain subcommittee are then documented on a Discipline Profile Form, Form SCEA-5. This Form documents the life cycle and recommended deployment decisions for the discipline using the definitions set forth below:

- Baseline: The current technology or process discipline in use by the agency or enterprise.

- Tactical: Technologies that the State may use in the near term, tactical time frame, approximately the next two years. Currently available products needed to meet existing business needs are identified here.

- Strategic: Technologies the State envisions using in the future that provide strategic advantage. Usually, anticipated marketplace products are identified here.

- Retirement: Technologies and/or process disciplines targeted for deinvestment during the architecture planning horizon (e.g., the next five years).

- Containment: Technologies and/or process disciplines targeted for limited (maintenance or current commitment) investment during the architecture planning horizon.

- Mainstream: Technology and/or process disciplines targeted as the primary deployment/investment option for new systems or legacy system migration over the architecture planning horizon.

- Emerging: Technology and/or process disciplines to be evaluated for future integration into the target architecture (e.g., mainstream) based on technology availability and business need (key for "evergreening" or keeping the architecture current).

Other information such as dependencies, notes, migration considerations, and a review date are also included as part of the development of a Discipline Profile. Once completed, Discipline Profiles are submitted to the CIO-ASG for review by other domain subcommittees and approval by the Architecture Oversight Committee. They then become part of the Technical Architecture Domain Report.

Recommending New Technical Standards and Technologies

During the course of technology and standards research, evolving standards and new technologies will be identified that support the domain architecture and the business goals implicit in the Enterprise Architecture Framework. Standards that are expected to be worthy of inclusion in the domain architecture when they are adopted by the IT industry should be declared as emerging standards that will be tracked by the domain subcommittee. They can then be included in the domain subcommittee's work plan and assigned a priority. For information on the assessment of emerging technical standards during routine research and monitoring of technologies, see Section 6 on Researching New Technologies, Products and Technical Standards.

Documenting Guidelines and Methods for Implementation and Management

Guidelines are practical advice for implementation and management practices based on the experience and research of the State's most knowledgeable experts. Methods are more formal and more prescriptive. When approved methods are embodied in products, they will become strategic products.

Standard Format for Domain Subcommittee Documents

Templates for the following documents are found in Appendix 2.

- Status Reports From a Domain Subcommittee (SCEA-6)

- Work Plan for Domain Subcommittee (SCEA-7)
- Gap Analysis Report From a Domain Subcommittee (SCEA-9)
- Domain Profile (SCEA-4)
- Discipline Profile (SCEA-5)

Cross-Domain Issues

A number of technologies and technical standards impact multiple domains and will require creative thinking and collaboration across domain subcommittee boundaries. It is essential that all members of all domains be familiar with the complete set of domain architectures. Some technology overlaps are more obvious than others. For some technologies, the synergy between domain architectures is a significant concern. Some domain technologies provide infrastructure services for other domains. In the practical application of architecture, systems are constructed with components from all the domains. Therefore, all of the domain architectures must be in congruence with each other. Open dialogue and cross-fertilization of ideas among the domains are very important. Cross-domain issues must be documented and discussed at domain subcommittee and Architecture Oversight Committee meetings.

Section 4: Changes to a Domain Architecture

This Section describes the types of changes that can occur within a domain architecture, the role of the domain subcommittee in reviewing these changes, and the processes and procedures for recommending changes to the Architecture Oversight Committee (AOC). First, there are formal approval processes for specific types of changes that will have a major impact on South Carolina's Enterprise Architecture. These changes include: (1) the Technical Compliance Assessment Process (see Figure 1 in Appendix 2) and (2) Change to Existing Technical Architecture Process (see Figure 2 in Appendix 2). Secondly, the domain subcommittee has the authority to make other types of changes on its own, as long as there is consensus among subcommittee members and the changes are consistent with the conceptual principles of the enterprise architecture as reference above, and the changes are reported to and accepted by the AOC. The specifics of the types of changes that fall into these two classes are detailed below.

Events Leading to Domain Architecture Changes

Federal /State Mandates

Federal/State mandates can prompt agencies to request revisions to the SCEA standards, which in turn should trigger a review of the appropriate domain architecture elements.

Requests From Agencies

Annual agency planning activities can result in requests to revise the SCEA source documents, which in turn will trigger a comprehensive review of the appropriate domain architectures. New business drivers and business information requirements, as well as changes in industry best practices for information technology, can also impact the enterprise architecture. These too will require a comprehensive review of all domain architectures to determine the impacts (if any).

Enterprise-wide Technology Projects

Routine and enterprise-wide technology project activities such as requirements analysis and architecture consultations may reveal a need to rework or refine portions of the architecture. As the architecture specifications for infrastructure services are defined, a deeper understanding of the cross-domain dependencies may require domain changes to reconcile lower level architecture elements such as interface standards, standard configurations and implementation guidelines.

Industry Best Practices, New Products/Applications, and Domain Subcommittee Activities

A basic premise of the SCEA process is that the domain architectures can only remain relevant through constant refinements based upon industry best practices, the assessment of new products and applications, and the resolution of gaps that are identified by the domain subcommittee. Change is supported and driven by the domain subcommittee and on-going research activities. Routine technology tracking and focused research related to specific conformance reviews and project consultations will reinforce the need for greater conformance in some areas and greater flexibility in others.

Frequency of Domain Architecture Updates

The frequency of updates to the domain architecture depends on a number of factors. Some technologies are rather volatile and experience rapid or frequent changes, while others change little in twelve months. Infrastructure and agency projects, while usually keyed to budget cycles, may occur at any time. As such, domain architecture review/updates should happen at least once per year, and should occur and work in conjunction with the CIO IT Planning cycle. The appropriate frequency of update should be established when a domain standard is approved by the AOC, and should be monitored by the CIO-ASG to ensure a review is initiated in a timely manner.

Two Primary Classes of Changes to Architecture Documents

There are two primary classes of changes to domain architectures and their associated documents: those that require the approval of the Architecture Oversight Committee and those that do not.

Changes that Require AOC Approval

The types of changes that require AOC approval are as follows:

- Adding or removing principles, technical standards, or product standards.
- Adopting methods that become mandatory or are embodied in products that are categorized as strategic.
- Significantly altering the meaning or intent of a principle, technical standard or product standard.
- Changing the status of a product, i.e., from research to strategic, from strategic to transitional, from transitional to obsolete.
- Making any change that will have major impact on technology products, agency financial or personnel resources, or on the ability of an agency to implement application systems.
- Requiring modification of a pending RFP, SOW, etc. or an RFP currently out for bid.
- Requiring changes to ongoing implementation projects.
- Greatly accelerating the agencies' transition planning for implementing a new architecture.

Changes that a Domain Subcommittee Can Make Under its Own Authority

Changes that can be made by a domain subcommittee, but must be reported to the AOC as information, include:

- Updating version numbers of product standards.
- Adding or refining narrative to provide a better explanation of component technologies or standards.
- Updating guidelines for the implementation and/or migrating to component technologies or technical standards.
- Updating the technology review section of a domain architecture document.

- Adding, updating or deleting a best practice that supports an existing product or standard, provided it does not have a major impact on an agency or on multiple agencies.
- Making changes to assignments within a domain.
- Adding new technologies, products or technical standards to the research category.
- Identifying gaps in the architecture.
- Removing technologies, products or technical standards from the research category if routine research and monitoring indicates that they are not viable or will not fit within the SCEA.

Process and Deliverables for Changes that Require AOC Approval

Changes to the domain architecture that require approval of the AOC will follow the Request for Change to Existing Technical Architecture Process (see Figure 2 in Appendix 2) or Technical Compliance Assessment Process (see Figure 1 in Appendix 2) and will utilize the Request for Assessment of Technical Architecture Form, SCEA-1 (see Appendix 2).

Process and Deliverables for Changes that Do Not Require AOC Approval

Changes that do not require approval by the Architecture Oversight Committee must always be documented and presented to the CIO-ASG for AOC review and for information. The domain subcommittee can request that the CIO-ASG update the Table of Changes located at the beginning of each domain architecture document. The change statement must include: (1) the date of the change, (2) a succinct, but complete description of the item that changed, (3) its location in the architecture document, and (4) the type or basis of the change (research, prototyping, revisions, etc.). An example of such a change may include, "*Middleware Product Selection Matrix added STC e*Gate™ to Messaging and Application Integration Products – Based on Gartner Research"*.

Changes can be proposed by anyone on the domain subcommittee, but must be reviewed and approved by a majority of the full domain subcommittee and submitted to the CIO-ASG as information for AOC review. The domain subcommittee must consider cross-domain implementation issues before making any change. Only then should the domain chairperson edit the document and submit it to the CIO-ASG. If the CIO-ASG concurs that AOC approval is not needed, the recommendation will be placed on the agenda of the next AOC meeting for information and review purposes only. Once accepted, the CIO-ASG will notify the other domain subcommittee chairpersons of the proposed change. The domain chairpersons will respond to any questions arising from peer review and commentary.

The new version of the domain architecture document, with appropriate change notices, will be published on the CIO web site. The CIO-ASG will also provide a summary report to the AOC outlining the changes that all domain subcommittees have made to the domain architectures. Once accepted by the AOC, advisory notices will be sent to the agencies by the CIO-ASG.

SCEA Update Process Workflows

In July 2003, the Architecture Oversight Committee (AOC) approved formal processes for updating domain architectures that include (1) Change to Existing Technology Architecture, (2) Technical Compliance Assessment, (3) Request for Waiver/Exception, and (4) Appeal of Architecture Decision. At this time, the processes do not address whether hands-on research or a

prototype or a pilot project will be required prior to reaching a final decision. It is the responsibility of the domain subcommittee chairperson, in consultation with the domain subcommittee, to decide if such research or testing is required. Regardless, each workflow is preceded by a set of common activities.

Initial Workflow Activities

The process starts with a request to the CIO-ASG to affect a change in the domain architecture or to assess technical compliance (Request for Assessment of Technical Architecture Form, SCEA-1) with the domain architecture. After consulting with the requesting entity, the CIO-ASG performs a preliminary review of the request, determines whether the request is a change to the architecture or is in compliance, and whether additional research will be required. The CIO-ASG posts the request and their preliminary determinations to the Web Site. When compliance is not obvious, the CIO-ASG will conduct necessary research and then forward the request, including the research and any other available information related to the request, to the appropriate domain subcommittee for evaluation.

The domain subcommittee handles the coordination with other domains that are impacted by the anticipated change to the domain architecture. The domain subcommittee will seek to involve the other domain subcommittees in the review process to the extent necessary. Following a commentary period for the other domain subcommittees, the domain subcommittee consolidates the reviews and communicates those results to all involved domain chairpersons. The CIO-ASG will work with the domain subcommittee to resolve any problems with the research, the information provided to the subcommittee, and coordination responsibilities.

If needed, the domain chairperson will assemble a workgroup and appoint a chairperson to proceed with the evaluation. Workgroups may be as small as two or three people, or as large as needed. Workgroup members are generally domain subcommittee members, unless a non-member is needed because of their subject matter expertise, or because the topic has cross-domain impacts. The domain subcommittee may also request that the CIO-ASG provide additional research/information for its evaluation. Following the conclusion of the research and evaluation, the domain subcommittee (with the assistance of the workgroup or discipline committee that evaluate the technology) will prepare a preliminary report and recommendation (Form SCEA-8, Recommended Action by a Domain Subcommittee, found in Appendix 2) and submit it to the CIO-ASG. This Form summarizes all the research and evaluation activities related to a recommendation. The CIO–ASG will finalize an information packet, post an agency notice, and prepare the recommendation for inclusion on the agenda of the next Architecture Oversight Committee meeting.

The domain chairperson will make a presentation to the AOC outlining the domain subcommittee recommendation. The domain chairperson will also present any dissenting views from the domain subcommittee or workgroup. In situations where the domain subcommittee is making a recommendation that is in conflict with a request from an agency, the agency will be given the opportunity to make a brief presentation (approximately 10 minutes) to the AOC.

The AOC will then review all information and come to a consensus. Depending on the nature of the requested change, this might take more than one meeting and require additional information

from the domain subcommittee and/or the CIO-ASG. Should the AOC approve the change to the domain architecture, the CIO-ASG will coordinate the updating and publication of the revised architecture. Should the AOC decline to approve the change, the CIO-ASG will document and publish the decision. The CIO-ASG will work with the domain subcommittee on any follow-up activities, requests for clarification, etc. requested by the AOC.

Section 5: Identifying and Closing Gaps in a Domain Architecture

As part of their ongoing research, or in reviewing and revising products and technical standards, domain subcommittees will identify "gaps" in domain technologies. Gaps are areas that are nonexistent or inadequate in the current IT environment. For example, gaps may occur as a result of the emergence of a new technology, the merger of existing technologies, or the need to deploy a technology that is non-standard in nature.

Once identified, these gaps should be captured on the Form SCEA-9, Gap Analysis Report from a Domain Subcommittee (found in Appendix 2 of this Guidebook).

This document will be utilized as a reference and planning tool by the CIO IT Planning Office, the CIO-ASG and the AOC. It is important that domain subcommittee chairpersons complete the process on a regularly basis (at least annually) to identify and document gaps in the architecture in order to be beneficial to the IT planning process.

Key Steps in Gap Analysis

1. Complete the identification of differences between the Technology Baseline (or "current state") and the target domain architecture.
2. Analyze gaps between the "as-is" and the target domain architecture.
3. Develop recommendations (actions) to close the gaps.
4. Prioritize recommendations taking into consideration interdependencies of technologies.

Step One – Identifying Domain Gaps

Differences Between Technology Baseline and Target Architecture

A large portion of the gap identification process occurs during the creation of the domain architecture. The domain subcommittee completes the identification of differences between the Technology Baseline (or "current state") and the target domain architecture within the context of strategies, principles, technical standards and product standards. Gaps are identified and become the basis for domain subcommittee activities and recommendations. See Figure 2 below, Example of Gaps for Data Management. The domain subcommittee identifies the technologies needed to satisfy the target domain architecture. Thus, the domain subcommittee must focus on technologies, industry standards and/or products, not how they are used or implemented. The additional work of gap identification focuses on the latter requirements.

Some sources of gaps are:

- Requirements for technical architecture that are not met by current technical infrastructure.
- Policies that do not exist but may be needed.
- Standards do not exist or are out-of-date.
- Products not included in architecture or are out-of-date.
- Ineffective/inconsistent configurations and infrastructure patterns.
- Lack of training in necessary skills.

Other sources of gaps are "overlaps" - needless complexity of products/solutions in the same technology category, and insufficient product standards for implementation.

Using Fundamental Questions

The domain subcommittee may find it useful to focus on the following fundamental questions when discovering gaps:

- What will this (principle, architectural requirement, etc.) mean to us?
- What are its impacts/issues?
- How was the gap revealed and does it impact other parts (i.e., processes, policies, metrics, culture or structure) of the architecture?
- Will the gap create exceptions to the architecture?

Figure 2: Example of Gaps for Data Management

- No policies for decisional data analysis
- No data warehouse
- No repository
- Multiple databases with duplicate data copies — No authoritative source identified
- No standard data movement technology
- No standard data cleansing technology — same data cleansed (using different tools) multiple times for multiple target databases
- Inconsistent usage of query and OLAP tools
- Too many products deployed

Gaps Created by the Exception Process or Agency Project Needs

Given the dynamic nature of technology and changing agency needs, it is likely that solutions using products or standards not covered in a domain architecture will be required. In such cases, the subcommittee should designate these products or standards as gaps and assign them to be researched and reviewed.

Refining Gaps

Once new gaps are identified, the subcommittee should put them into logical groupings and consolidate related gaps. Gaps should be reworded for clarity and reviewed by the entire domain subcommittee to confirm the gap.

Step Two – Analyzing Domain Gaps

Once the gaps have been identified and logically grouped, they need to be analyzed by the subcommittee. The analysis of domain gaps requires creative and collaborative thinking. There is no set procedure for this analytic process.

For each gap identified, the subcommittee should develop alternative solutions to "fill" the gap. For example:

- Is a new solution (application, data, technology) required?
- Is major research including hands-on or Proof of Architecture Assessment required?
- Are new skills required?
- Is a new approach required?
- Is a new implementation of old technology required?

- Are new behaviors required?
- Are new IT policies required?
- Are new or expanded support resources required?

The domain subcommittee should "flesh out" the solution details: description, components, rationale (principles, requirements and gaps being addressed), business benefits, dependencies (if any), and the specific actions steps required to close the gaps. If time permits, the subcommittee should provide sufficient detail in the initiative description for use in future comparisons and capital budgeting process.

For the larger or more complex gaps, it is helpful to consider incremental steps for closing these gaps, and if additional research or information is needed, request assistance from the CIO-ASG.

Step Three – Developing Recommendations

Recommendations on closing the gaps can take many forms. For example:

- Eliminate duplicate and inconsistent databases; functionally duplicate applications; obsolete and unused technology components.
- Enhance and support database sharing.
- Promote shared applications and component reuse.
- Replace nonstandard products/configurations with standard offerings.
- Other changes (e.g., re-training to develop new skills, restructuring working groups or organizations, it policy making).

Step Four – Prioritizing Recommendations

Not all gaps require immediate action, for instance, some gaps:

- Cannot be filled right away,
- Should not be filled (for business reasons),
- May never be filled due to priorities, or
- May be optionally filled by business units or an enterprise effort.

Gaps that require action must have priorities established for them. These priorities can be internal to the domain subcommittee or external, if a project is recommended to fill the gap. This latter prioritization should be done jointly with CIO-ASG. This helps to ensure that the priorities are as consistent as possible with those of enterprise business needs, other active or planned initiatives, and those of other domain subcommittees.

Section 6: Researching New Technologies, Products and Standards

The ongoing activities of domain subcommittees will require access to professional research services. The CIO has contracted with Gartner Group to perform these services. Other research services (e.g. META) are also available on an as needed basis. The CIO-ASG will conduct preliminary research prior to forwarding requests to domain subcommittees. If a subcommittee requires additional information, the chairperson may request that the CIO-ASG obtain additional information or may request the information directly from the research services. This Section of the Guidebook deals with these research activities.

Reasons for Conducting Research

The fundamental reasons for conducting research are a reflection of the original factors that lead to the creation of a domain architecture. These are as follows:

Reviews of Technology in the Marketplace and Technology Trends

One of the primary on-going activities of the members of a domain subcommittee is the regular review of technology trends and changes. Because domain architectures are not static, but adaptive, members must remain current with major changes in technology.

Gap Analysis Activities

Another primary activity of a domain subcommittee is filling known or newly created gaps in the architectures (see Section 5, Identifying and Closing Gaps in a Domain Architecture). In most instances, this will require access to new or additional research.

Technical Compliance Assessment

Another primary activity of a domain subcommittee is to determine if a proposed technology product, application or solution is in compliance with an existing IT enterprise architecture standard.

SCEA Changes

The Enterprise Architecture Framework is not static, but adaptive, though the frequency of changes occurs less often than with domain architectures. The same basic influences on the development of a domain architecture (see Section 3, Developing a New Domain Architecture) can also lead to changes in existing domain architectures:

- Change in enterprise business drivers.
- Change in requirements for enterprise technical architecture.
- Change in enterprise IT principles.
- Additions to or changes in enterprise applications portfolio.

Analysis of the impact of changes on the Enterprise Architecture Framework is the highest priority task of a domain subcommittee and will generally require new or additional research.

New and Planned Projects

Projects often result from federal/state mandates, from needs internal to an agency and from enterprise initiatives. Types of projects that may require additional research include:

- CIO and multi-agency infrastructure projects.
- Multi-agency and single agency IT projects.

Assigned Research

Assigned research is limited duration, topic specific research that is being undertaken by the CIO, a domain subcommittee, workgroup or discipline committee. Assigned research is normally derived from one of the four SCEA processes and is necessary to make or clarify a recommendation for review by the AOC.

Domain Subcommittee Research

What Needs to be Researched

The predominant research topics are trends which produce changes in the domain technologies, product standards or technical standards. Such trends generally require that specific research be undertaken by subcommittees for proposed changes to the domain architecture. Additionally, the gap analysis/closure process often generates a need for specific research. Other research topics are generally assigned by the domain subcommittee chairperson.

How Often Should Technology be Researched

A review date for all standards approved by the AOC will be established when such approval takes place. The domain subcommittee will determine what the review/refresh cycle should be for each standard, and the CIO-ASG will ensure that this schedule is adhered to. The term of the refresh cycle shall be based on the marketplace dynamics for the specific technology involved. However, the review/refresh cycle may be modified if required by a new project or by a request for conformance review by an agency. The need for research may be triggered by any number of such events.

The timing of the tracking of trends and changes in technology is up to the domain subcommittee members and will be based on their own personal styles.

Who Does the Research

Research into trends and changes in technology must be available to all domain subcommittees, workgroups and discipline committees on a timely basis. Such research will initially be conducted by the CIO-ASG through its contract with Gartner Research Services. Additional research may be requested/performed by the domain chairperson as appropriate.

What Sources Should be Used for Research

A variety of sources is available to domain subcommittee members. Subcommittee members, in all likelihood, have specific publication Web sites that they visit on a regular basis. Most manufacturers and most publishers of software have product Web sites, as do standards bodies.

In addition, the State has contracted with Gartner Group for professional research services and can obtain research from META Group on specific topics on an as needed.

Gartner Group

Gartner Group provides research material to the CIO on a regular basis. Subcommittee members interested in seeing this material should contact their domain subcommittee chairpersons. The CIO will consolidate these materials in a library, as well. Specific questions for Gartner Group should be directed to CIO-ASG.

META Group

Meta Group provides a variety of research options ranging from 1-3 pages (called Deltas and Meta Faxes), on up to 20 or more pages (Meta Briefings and Meta Practices). META also offers conference proceedings and teleconference proceedings. The CIO-ASG can acquire materials on specific topics on an as needed basis.

The Research Process

The research process for domain subcommittee research activities has no formal structure. The only requirements are for documentation of the research (see below). The process for research conducted for domain architecture changes that require the approval of the AOC is more highly structured.

Initial Steps in Structured Research

The formal change process starts with a decision to affect a significant change in the domain architecture (see above). After consulting with the CIO-ASG, a domain chairperson prepares a Form SCEA-7, Work Plan for a Domain Subcommittee. A template for this can be found in Appendix 2. By this point in time, the domain subcommittee should have determined the degree of effort required and whether or not hands-on research will be required.

The CIO-ASG will coordinate any resources needed with the CIO's Project Management Services Group to determine the potential impact on CIO or agency projects. The domain subcommittee handles the coordination with other domains that are impacted by the anticipated change to the domain architecture. Domain subcommittee will also maintain the involvement of other domain subcommittees in the review process. Following a short commentary period for the other subcommittees, the domain subcommittee coordinates the reviews and communicates the results to all involved domain chairpersons. At this point, the CIO-ASG will work with the domain subcommittee to resolves any problems with the scope of the research. The domain chairperson assembles a workgroup and appoints a chair. Workgroups may be as small as two or three people, or as large as needed. Workgroup members are generally from the domain subcommittee, unless a non-member is needed because they have special expertise, or because the topic has significant cross-domain impacts.

If a workgroup is established, it should be responsible for conducting the research and evaluation outlined in the action plan. Following the conclusion of the research and evaluation, the workgroup prepares a preliminary report and recommendation (the Form SCEA-8, Recommended Action by a Domain Subcommittee) and submits/presents it to the

entire domain subcommittee for review and comment. Once a final version has been approved by the domain subcommittee, the chairperson forwards the SCEA-8 to CIO-ASG for review and for a peer review by the other domain chairpersons. The chairpersons make recommendations for adjusting the SCEA-8 and proceed to the next step in the process. The nature of the next step will depend on whether additional research is needed.

Outcomes from Research

Category of Change

- Creating new principles, disciplines, and technical or product standards.
- Moving a technical or product standard between categories, (e.g., from mainstream to containment or from containment to retirement).
- Editing or modifying principles.
- Updating the version of an existing technical or product standard.
- Adding a new discipline to the domain architecture.

Documentation Requirements

Various reports must be completed by the domain subcommittee chairperson each month, depending on the activities occurring during that month, including:

SCEA-6 Status Report for Domain Subcommittee
SCEA-7 Work Plan for Domain Subcommittee, and
SCEA-8 Recommended Action by a Domain Subcommittee.

Section 7: Coordination with IT Planning and IT Procurement

Decisions made by the Architecture Oversight Committee (AOC) will be distributed to both the IT Planning and IT Procurement Groups. The IT Planning Group will use this information to evaluate agencies' IT plans and planning requests. This information will become the basis for the state's information technology plan. The IT Procurement Group will use this information to develop state term contracts for products that conform to the standards established by the AOC, and also to assist agencies in conducting procurement related activities such as:

- Developing IT procurement and contract requirements,
- Making buy-versus-develop decisions,
- Determining evaluation criteria in RFPs,
- Upgrading hardware and infrastructure,
- Selecting software package and/or tools, and
- Making design decisions in the context of a specific IT project or application system.

From time to time, domain subcommittee members may even be asked to review Requests for Proposals (RFPs), vendor responses to RFPs, agency IT architectures and/or agency IT projects. This can be accomplished as an individual or as a team effort. The reviews will assess and evaluate conformance of projects or proposals to SCEA business drivers, IT principles, and domain principles, standards and guidelines.

IT Planning Processes

The IT Planning Group will follow its standard practices in evaluating IT plans and planning requests. If this Group determines that a plan and request is in compliance with SCEA standards, it will approve this plan or request, and no action is required by the domain subcommittee or the AOC. If not in compliance with SCEA standards, the IT Planning Group will first attempt to resolve any differences with the agency. If this effort is unsuccessful, the IT Planning Group will submit the plan or request to the appropriate domain subcommittee for review and action. Existing domain architecture documents shall serve as a basis for such evaluations. Such reviews should evaluate conformance of the plan or request to SCEA principles, domain architecture principles, technical and product standards, and best practices.

IT Procurement Coordination

There may be a need for a domain subcommittee to assist the IT Procurement staff in developing or reviewing technical specifications, providing clarifications to vendors regarding specific RFP requirements and evaluating responses to RFPs. If a review is requested by the IT Procurement Group, a list of questions will be provided to the domain chairperson with reference to specific documents, sections, etc., along with a description of the assistance needed. The IT Procurement Group will provide specific guidance to the domain subcommittee chairperson as to the approach and content of the desired deliverables.

Appendix 1: Glossary of Abbreviations

Explanation of Abbreviations:

AOC	Architecture Oversight Committee
CIO	Division of State Chief Information Officer
CIO-ASG	Division of State Chief Information Officer – Architecture Support Group
CTO	Chief Technology Officer
IT Planning	IT Planning Group
PMSG	Project Management Services Group
SCEA	South Carolina Enterprise Architecture
RFP	Request for Proposal
SOW	Statement of Work

Appendix 2: Templates/Processes for Domain Subcommittee Activities

Form SCEA-1

Tracking Number:

REQUEST FOR ASSESSMENT OF TECHNICAL ARCHITECTURE

This form is to be used for the following purposes: (1) to recommend a technology product, application or solution for inclusion in the technical architecture; (2) to recommend an update to a product, application or solution that is currently included in the technical architecture; or (3) to determine if a product, application or solution is in compliance with the existing technical architecture. Once, complete, the requester may submit this form either manually or electronically to the Division of the State Chief Information Officer. Where possible, additional information should be submitted to enhance assessment. This additional information may also be submitted with this form either manually or electronically. If submitting information manually, mail to: Division of State CIO, 1201 Main Street, Suit 820, Columbia, SC 29201.

BASIC INFORMATION (required for all requests):

Name of Requestor:	Submittal Date:
Agency:	Telephone Number:
Address:	Email Address:
Position:	Fax Number:
Architecture Domain:	Discipline:
Agency Director/Committee Chair Authorization: (if applicable)	

TYPE REQUEST (required for all requests):

Change to Existing Technical Architecture: ❑ Addition to Technology Architecture ❑ Update to the Existing Technology Architecture
❑ Assessment of Compliance with Existing Technology Architecture

IF ADDITION TO TECHNOLOGY ARCHITECTURE ONLY - PROPOSED TITLE/NAME:
(The title or name should uniquely identify the technology to be assessed. It might include product name, copyright owner, version/release identification, etc.)

PRIORITY (required for all requests):

❑ High Priority (s*ignificant impact on agency operation*)
❑ Medium Priority (*normal processing*)
❑ Low Priority *(can be delayed if necessary)*

DESCRIPTION OF TECHNOLOGY TO BE ASSESSED FOR COMPLIANCE ONLY:
(Provide a description of the technology to be assessed for compliance with an existing technical architecture standard)

Describe the proposed addition/change to the technology architecture:
Describe any known areas in which this technology may conflict with existing technical architecture standards:
Describe the current base of installation and history associated with its implementation:
Identify additional requirements for the implementation of this technology:
Identify where the technical expertise necessary to manage this proposed technology will be acquired:
Provide other information as appropriate:

PURPOSE, PRIORITY AND CONSTRAINTS/MANDATES (required for all requests):
(Describe briefly the need or problem being addressed with this technology from the agency perspective)

Describe areas or processes to which the technology would be applied:

Describe any changes in business processes that would result from the adoption of the technology as a standard:
Describe the degree to which the adoption of this proposed standard might impact suppliers, peers, customers, or clients:
Proposed addition/change significantly altering the meaning or intent of which principle, technical standard or product standard?
How will proposed addition/change impact the status of a product, i.e. from mainstream to containment, from emerging to mainstream, from containment to obsolete or introducing a new product as emerging?
Provide other information as appropriate:

IMPACT ON OTHER DOMAINS (required for all requests): *(if known, what is the requestor's estimate of the impact of an assessment of technical compliance on the any of the following domains and their disciplines)*

Presentation Services:
Communication Services:
Middleware and Messaging:
Computing Services:
Enterprise Applications:
Systems Management Services:

FINANCIAL IMPACT (required for all requests):

What do you expect this implementation to cost, over what time period:
What are you currently spending to perform this function:
If savings and efficiencies are anticipated, identify the efficiencies, the estimated amount of savings, and if known, the source(s), over what period of time and whether or these cost savings are recurring.
If known, what is your peer group/benchmark spending, using what technology: *(identify source(s) of data)*

***MIGRATION CONSIDERATIONS (if any*)**: (outline your migration strategy, including timetable and resource requirements.)

ADDITIONAL BACKGROUND: *(List evaluation criteria, alternatives considered, and any other pertinent information and analysis used in preparing this proposal)*

Figure 1. Technical Compliance Assessment Process

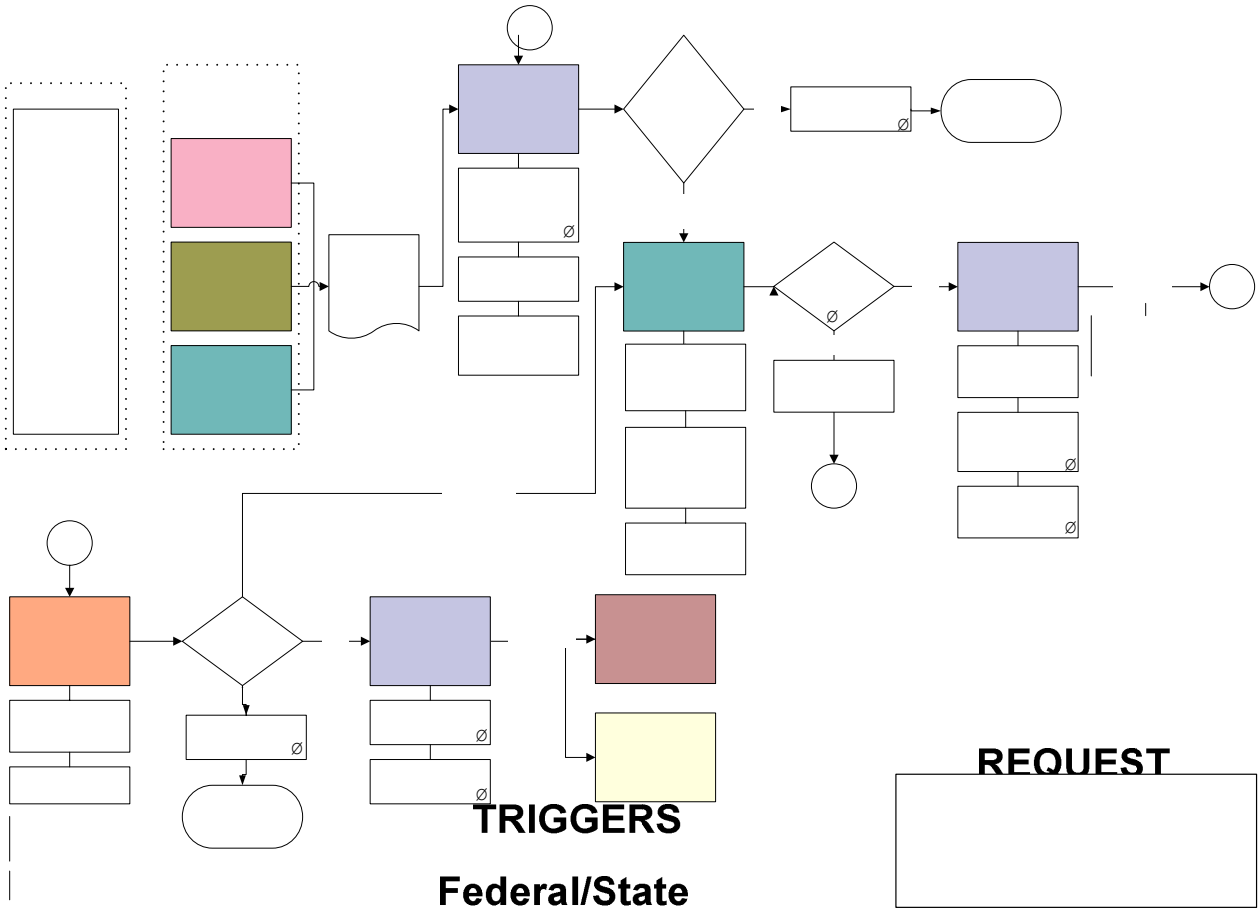
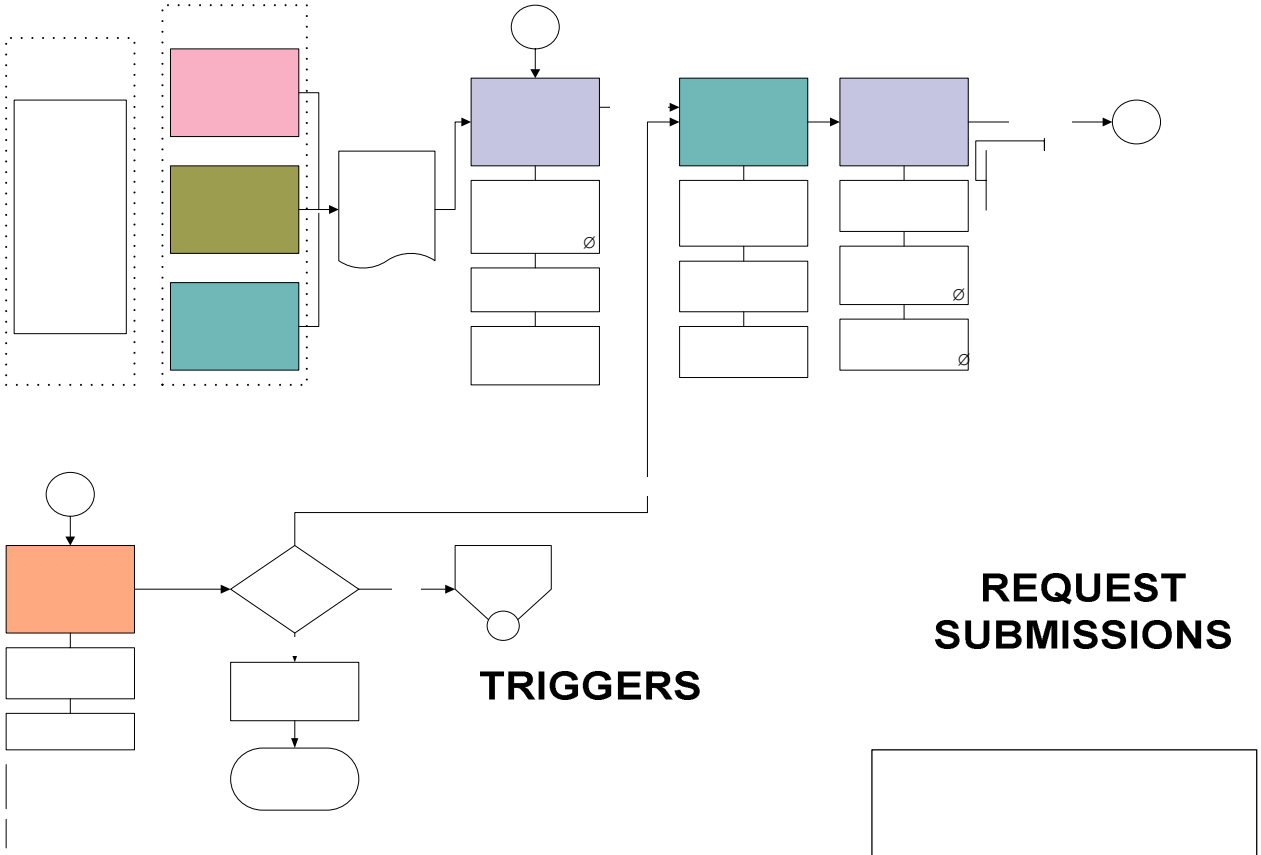


Figure 2: Request for Change to Existing Technical Architecture Process



Form SCEA-2

Tracking Number:

REQUEST FOR WAIVER/EXCEPTION TO TECHNICAL ARCHITECTURE

This form is to be used for the purpose of requesting a waiver or exception to a technology product, application or solution that is currently included in the technical architecture. Once, complete, the requester may submit this form either manually or electronically to the Division of the State Chief Information Officer. Where possible, additional information should be submitted to enhance assessment. This additional information may be submitted with this form either manually or electronically. If submitting information manually, mail to: Division of State CIO, 1201 Main Street, Suit 820, Columbia, SC 29201.

BASIC INFORMATION (required for all requests):

Name of Requestor:	Submittal Date:
Agency:	Telephone Number:
Address:	Email Address:
Position:	Fax Number:
Architecture Domain:	Discipline:
Agency Director/Committee Chair Authorization: (if applicable)	

IDENTIFICATION OF TECHNICAL STANDARD TO BE WAIVED/EXCEPTED:

SCOPE OF THE PROPOSED WAIVER/EXCEPTION: *(Provide a description of the waver/exception, include the impact on introducing a non-standard technology on existing applications, infrastructure, and resources)*

REASON FOR WAIVER/EXCEPTION:

❑ Federal/State Mandate
❑ New technology products/application
❑ Special agency requirements
❑ Grant requirements
❑ Technology Project
❑ Other (please specify)

PRIORTY:

❑ High Priority (s*ignificant impact on agency operation*)
❑ Medium Priority (*normal processing*)
❑ Low Priority *(can be delayed if necessary)*

IMPACT ON OTHER DOMAINS: *(if known, what is the requestors estimate of the impact of an assessment of technical compliance on the following domains and their disciplines)*

Presentation Services:
Communication Services:
Middleware and Messaging:
Computing Services:
Enterprise Applications:
Systems Management Services:

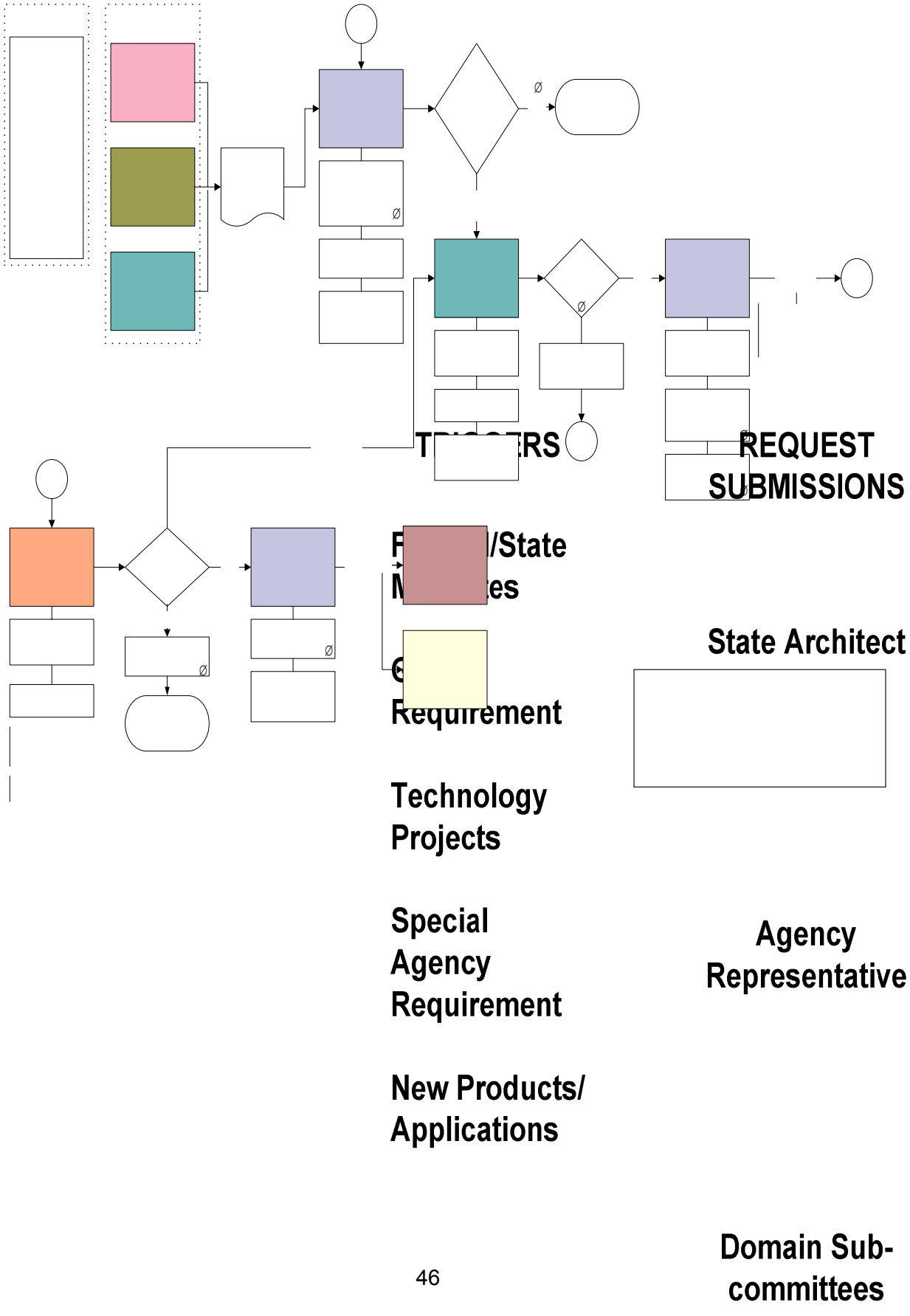
BUSINESS JUSTIFICATION FOR WAIVER/EXCEPTION:

FINANCIAL IMPACT:

What is the estimated financial impact of this waiver/exemption:
What are you currently spending to perform this function:
If know, identify the source(s) and amount(s) of savings associated with this waiver/exemption:

ADDITIONAL BACKGROUND: *(List pertinent information and analysis used in preparing this proposal)*

Figure 3: Request for Waiver/Exception Process



Form SCEA-3

Appeal Number: **Original Tracking Number:**

REQUEST FOR APPEAL OF TECHNICAL ARCHITECTURE DECISION

This form is to be used to request a review or hearing on a previous decision by the Architecture Oversight Committee. Once, complete, the requester may submit this form either manually or electronically to the Division of the State Chief Information Officer. Where possible, additional information should be submitted to enhance assessment. This additional information may be submitted with this form either manually or electronically. If submitting information manually, mail to: Division of State CIO, 1201 Main Street, Suit 820, Columbia, SC 29201.

BASIC INFORMATION (required for all requests):

Name of Requestor:	Submittal Date:
Agency:	Telephone Number:
Address:	Email Address:
Position:	Fax Number:
Architecture Domain:	Discipline:
Agency Director/Committee Chair Authorization: (if applicable)	

SCOPE OF APPEAL: *(Provide a description of the appeal, address specific issues and/or concerns that would impact a previous decision made by the Architecture Oversight Committee)*

PRIORTY:

❑ High Priority (s*ignificant impact on agency operation*)
❑ Medium Priority (*normal processing*)
❑ Low Priority *(can be delayed if necessary)*

REASONS FOR THE APPEAL:

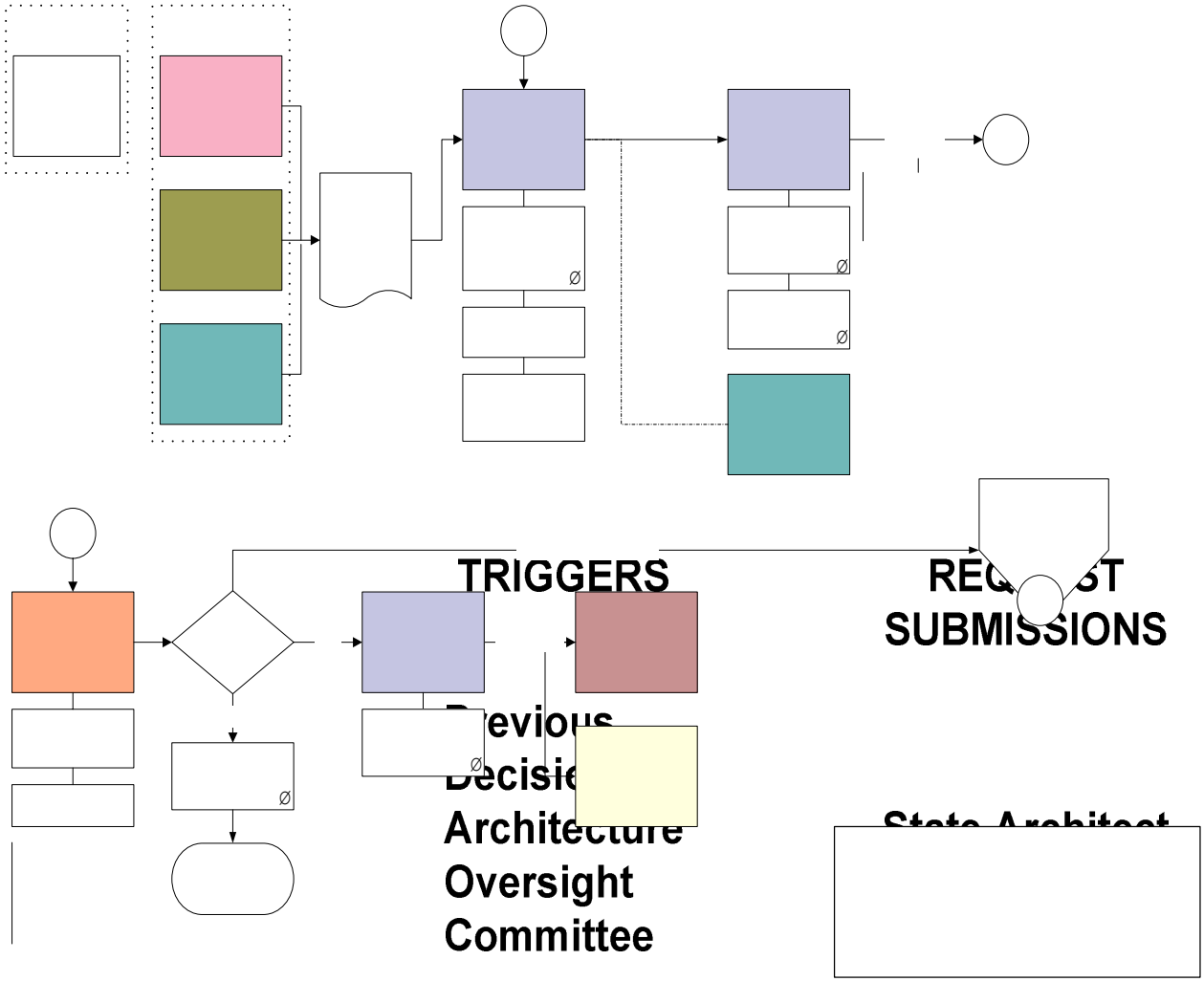
Addresses issues/concerns outlined in the original decision.

Describe any additional relevant information regarding the appeal.

BUSINESS JUSTIFICATION FOR APPEAL:

ADDITIONAL BACKGROUND: *(List pertinent information and analysis used in preparing this appeal)*

Figure 4: Appeal of Technical Architecture Decision Process



Form SCEA-4

DOMAIN PROFILE

DISCIPLINES

DOMAIN STRATEGY

DOMAIN PRINCIPLES/BOUNDARIES

Form SCEA-5

DISCIPLINE PROFILE

Discipline Boundaries:

Discipline Roadmap For:

Current	2 Years	5 Years	
Baseline Environment	**Tactical Deployment**	**Strategic Direction**	
		Shared	**Agency**

Retirement Targets	**Mainstream Platforms** (must be supported)
Containment Targets (fully supported but no new development)	**Emerging Platforms**

Implications and Dependencies

Roadmap Notes

DISCIPLINE PROFILE

Discipline Standards:

Migration Considerations:

Exception Considerations:

Miscellaneous Notes:

Date Last Updated:

Form SCEA-6

STATUS REPORT FROM A DOMAIN SUBCOMMITTEE

Meeting Information

Meeting Date and Time:

Domain Subcommittee:

Subcommittee Chairperson:

Members Attending the Meeting:

Meeting Details

Meeting Agenda

Adapt as needed, but these should be probable items.

- member reports on on-going research
- workgroup status reports (if any)
- discipline committee reports (if any)
- action items
- new business

Results of On-Going Research

Briefly, describe results and recommendations from on-going research.

Subcommittee Status Reports

Briefly, describe status of any subcommittee activities.

Recommendations to be Submitted to AOC

Use this space to describe recommendations by the subcommittee for proposed changes to the domain architecture

Action Items

Use this space to report on items needed resolution, next steps needed, etc.

Comments

Use this space for any comments, suggestions, etc.

Form SCEA-7

WORK PLAN FOR DOMAIN SUBCOMMITTEE

Priority	Description	Req. No.	Date Received	Received From	Assigned To	Projected Completion Date

Priority	Description
1	Critical/emergency request submitted by an agency or the AOC. These requests take precedence over other issues until they are resolved (e.g., a time critical Federal or regulatory mandate or a legislative directive with a short implementation timeframe).
2	Expedited request, the delay of which would hinder normal operations of an agency or the enterprise.
3	Request involving an issue (e.g. change of software version from containment to retirement) that does not hinder an agency's ability to operate.
4	Request representing an issue that will take a significant time commitment to complete (e.g. evaluate new line of products) and for which there is no pressing deadline.
5	All other requests.

Form SCEA-8

RECOMMENDED ACTION BY A DOMAIN SUBCOMMITTEE

Basic Information

Submittal Date:

Domain Subcommittee:

Subcommittee Chairperson:

Contact Information (phone or email):

Scope of the Change

Description

Provide a description of the requested/proposed change.

Priority and Time Frame

Indicate the priority of this change – if it needs to be expedited, explain why and indicate date needed.

Architectural Impact

Briefly describe impact on domain architecture and SCEA. Also, indicate if there will be any impact on other domains.

Financial Impact

Provide estimated financial impact of the proposed change, if available. Include TCO analysis when possible.

Need or Justification (may be more than one)

Check the reason for requested change. If there is more than one reason for the requested change, check all appropriate boxes. (Copy this ✔ and paste over the box)

- ❑ Domain subcommittee technology research activities
- ❑ Domain subcommittee gap analysis activities
- ❑ Agency project
- ❑ Agency waiver/exception process
- ❑ Change in enterprise strategies and/or business direction
- ❑ Infrastructure implementation or proposed CIO service offering
- ❑ Appeal of AOC decision

❑ Other (please specify _____)

Summary of Research Performed

Type of Research

Summarize the research that supports the subcommittee's recommendation. Attach copies of research, if appropriate.

Scope of the research

Describe the scope of the research. Indicate workgroups or discipline committees involved in this research.

Describe any alternative standards or products considered by the subcommittee.

Recommendation(s)

YES – change the domain architecture as follows (attach domain or discipline profiles as appropriate):

Domain architecture strategies/principles

Discipline profiles (technology standards, product standards, life cycle designation, etc.)

NO – action not recommended at this time

High risk, technology not mature – continue tracking

Needs further evaluation

Inconclusive results/insufficient information at this time

Negative evaluation or results

Other (specify)

Dissenting Opinions

Summarize dissenting opinions from members of domain subcommittee, workgroup or discipline committee, if any.

Agency Position/Comments

Briefly indicate agency's desired outcome if different from recommendation of domain subcommittee.

Form SCEA-9

GAP ANALYSIS REPORT FROM A DOMAIN SUBCOMMITTEE

Note: This is in Excel spreadsheet format

Basic Information

Meeting Date and Time:

Domain Subcommittee:

Subcommittee Chairperson:

Members attending the meeting

Instructions

Column A	Planning Category	attempt to group similar gap items that could be incorporated in the same (future) plan
Column B	Gap Description	brief description of the gap item (or a label)
Column C	Priority	relative priority within the domain for resolving the gap item; ranked from **A** highest to **C** lowest
Column D	Cross Reference	list of other gap items that are related or linked to this gap item, based on the gaps identified in the domain architecture document
Column E	Short List	gap items to be acted upon first (low hanging fruit, most impact, etc.)
Column F	Order	used to order the short list and remaining gaps as part of the planning process
Column G	Domain Principles Supported	list of domain principles supported by resolving the gap
Column H	Comment/Action Item	indicate how the gap will be resolved, and any other comments that are relevant; this cell can include historical actions
Column I	Skills	skills required as an aide to resource planning and assignment of subcommittee members to activities or research

Planning Category	GAP	Priority	Cross Reference	Short List	Order	Domain Principles Supported	Comment/Action Item	Skills Required

Appendix 3: Summary of Roles and Responsibilities

Architecture Oversight Committee

The Architecture Oversight Committee (AOC) is responsible for the review and approval of technical standards, and for the promotion of the SCEA statewide. Its membership is made up of senior IT leaders and senior agency management personnel. The AOC approves domain subcommittee recommendations/deliverables (i.e., technical standards, design principles, product standards, best practices, and standardized configurations) and adjudicates exceptions to architecture standards and appeals of architecture decisions. The AOC is chaired by the State's Chief Technology Officer.

Responsibilities include:

- Maintaining the SCEA process discipline and sponsoring new and revised standards.
- Approving domain subcommittee deliverables that impact agencies (i.e. technical standards. design principles, product standards, best practices and standardized configurations).
- Adjudicating appeals for exceptions to architecture standards.
- Reviewing domain and Architecture Oversight Committee initiatives and recommend priorities.
- Reviewing possible infrastructure impacts of planned projects.
- Utilizing SCEA teams as a resource in understanding domain deliverables.

Domain Subcommittees

The domain subcommittees provide the knowledge and expertise required to develop the technical architectures and standards for the enterprise architecture process. Each subcommittee consists of technical experts from across the State. These subcommittees are responsible for the development and maintenance of Domain Architecture Documents, including the domain specific deliverables (i.e. domain principles, technical standards, product standards, and best practices), and administrative documents such as meeting minutes, action plans, gap analyses, etc. The subcommittees are expected to keep abreast of new technology and make recommendations on new technology to close gaps in the current environment.

CIO Architecture Support Group (CIO-ASG)

The CIO Architecture Support Group coordinates the SCEA process and all associated activities. This Group is responsible for coordinating/supporting all domain subcommittee, as well as communications and web site content/maintenance.

Responsibilities of the CIO Architecture Support Group include:

- Ongoing enhancement, communication and governance of SCEA.
- Coordination of activities and deliverables between domain subcommittees.
- Coordination and quality assurance of deliverables and presentations to AOC.
- Provide staff support to AOC and the domain subcommittees.
- Coordinating publication of domain architecture documents.

- Conduct research and coordinating the use of research services by the AOC and the domain subcommittees.

Project Management Services Group (PMSG)

The PMSG exists at the enterprise level to coordinate and monitor major IT projects. CIO personnel staff this Office

Responsibilities include:

- Establish and promote the use of a standard project management methodology including forms, templates, reports, etc.
- Monitor the state's portfolio of major IT projects reviewing standard reports and providing the CIO and agency management with recommendations on project activities.
- Develop project management training and certification programs for state employees.
- Provide project management services upon request by an agency and for enterprise projects.